

The Effect of Instructional Guidelines on Patients' Knowledge, Practice, and Stress Regarding Thoracoscopic Surgery

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Abstract

Background: Thoracoscopic surgery is an invasive surgical technique used to diagnose and treat problems in the chest. Since most patients are unfamiliar with the thoracic surgical procedure, the amount of information may be overwhelming, especially if patients receive a new cancer diagnosis or are unaware of the scope or hazards of the anticipated surgery. On the day of operation, it is frequently necessary to reiterate the initial consultation. **So, the current study** aimed to evaluate the effect of instructional guidelines on patients' knowledge, practice, and stress regarding thoracoscopic surgery. **Design:** This study was carried out using a quasi-experimental research design. **Setting:** This study was applied in the thoracic surgery department at Damanhour university hospital. **Subjects:** It consisted of a purposive sampling technique enrolled to select a sample of fifty patients undergoing thoracoscopic surgery in the previously selected department who agreed to participate in the study and were randomly assigned into two equal groups, with 25 patients in each group (the experimental group who received instructional guidelines and the control group who received routine hospital care only). **Tools:** Patients' interviewing sheet, patient's knowledge questionnaire, patients' practice assessment sheet, and Cohen's Perceived Stress Scale Short Version (PSS-10). **Results:** There was a highly statistically significant difference between the study group patients' pretest and posttest in total knowledge and practice after the implementation of instructional guidelines. There was no statistical significance reducing the difference between both groups as regard stress scores. **Conclusion:** There was an improvement in total knowledge, practice, and reducing stress after instructional guidelines implementation with higher percentages in the study group than in the control group. **Recommendations:** instructional guidelines should be given for patients to improve their knowledge, practice, and reduce stress regarding thoracoscopic surgery.

Keywords: Instructional guidelines, Patients' knowledge, practice, and stress, Thoracoscopic surgery

Introduction:

Thoracic surgery first appeared in Bologna in at least 1,499 A.D. when a chiroprapist by the name of Rolandus performed a wedge section of inflamed lung tissue. When it comes to the postoperative period, patients who have had thoracic surgery are exceptional because if they experience an acute sickness, their care is frequently different from that of any of their surgical or general medical patient counterparts. As an illustration, the current guidelines feature a separate section for the care of atrial fibrillation after cardiothoracic surgery if a patient develops postoperative atrial fibrillation (National Institute for Health and Care Excellence, 2021). Additionally, certain thoracic surgery patients have a completely different cardiac arrest care

procedure than all other patients who have not undergone thoracic surgery because the standard Advance Life Support algorithm is not appropriate for these individuals (Lott et al., 2021). The use of video-assisted thoracic surgery in recent years has significantly advanced thoracic surgery's use of minimally invasive methods for both the diagnosis and treatment of early-stage lung cancer.

In recent years, the international literature has provided a thorough description of the function of minimally invasive procedures in abdominal surgery and the effects they have on metabolism, inflammation, and immune response. Furthermore, certain research (Walker et al., 2019) emphasized their value in thoracic surgery. Morbidity and mortality rates are correlated with increased surgical stress and systemic inflammatory response. Additionally, the open thoracotomy technique in cancer

patients causes significant immunologic alterations that could raise the risk of complications (Puggioni & Wong, 2018). A recently created technique for thoracic surgery called video-assisted thoracoscopic surgery involves inserting a tiny video camera through tiny incisions into the patient's chest. The anatomical structure on which the surgery is being performed and the instruments being utilized are both visible to the surgeon. It is a minimally invasive surgical procedure used to identify and address chest issues (Vallance et al., 2016). Viewing the lungs and other tissue is possible during video-assisted thoracic surgery. Through tiny chest incisions, a doctor inserts surgical instruments and a tiny telescope. The doctor may view an image of the lungs thanks to the telescope's connection to a video camera. After surgery, the patient might need to stay in the hospital for one to three days. Its key advantage has been avoiding a thoracotomy incision, which enables quicker recovery times, less surgical morbidity, and faster returns to regular activities (Yeung, 2016).

Pleural, lung, and mediastinal surgery are all performed using video-assisted thoracic surgery, both for diagnostic and therapeutic purposes. Stapled lung biopsy, lobectomy or pneumonectomy, resection of the peripheral pulmonary nodule, assessment of mediastinal tumors or adenopathy, bullectomy, management of loculated empyema, pleurodesis of malignant effusions, repair of a bronchopleural fistula, chest trauma, pericardial window, sympathectomy, and truncal vagotomy are some of its specific indications (Guerrini et al., 2016). The patient, surgeon, anesthesiologist, nurses, resident doctors, respiratory therapists, and a myriad of other participants must work together in a coordinated manner for the best possible results following thoracic surgery, as with any type of surgery. The term "coordinated activity" suggests that each participant is aware of their role and expectations. It involves the preoperative and postoperative phases for the patient, who is typically ignorant during the surgical process. Preoperative teaching helps patients understand their part in the process and how speed up or slow down recovery (Refai et al., 2017).

The larger surgical team, which frequently consists of nurses, medical assistants, resident physicians, nurse practitioners, and anesthesiologists, is what is being emphasized rather than the role of the surgeon. The amount

of information may be daunting because the majority of patients are unfamiliar with the thoracic surgical procedure. This is especially true if the patient receives a new cancer diagnosis or has no prior awareness of the scope or hazards of the anticipated surgery. As a result, crucial ideas are frequently delivered multiple times or in different ways (Rubin et al., 2019). A repeat preoperative visit or even the day of surgery may be necessary to reiterate information that the surgical team covered during the initial consultation. A referral for surgery is frequently made during the initial appointment in the authors' practice. The surgeon is given enough time to outline the procedure, along with any risks, advantages, and possible alternatives. Although it is encouraged, patients frequently find it difficult to process all the information and come up with pertinent questions. As the patient has had time to absorb the knowledge, integrate it, and accept it on an intellectual and emotional level, questions frequently surface in the days that follow. If the surgeon recommends surgery during the initial appointment, the clinical nurse specialist spends additional time with the patient explaining and reiterating what was said, answering queries, and giving a phone number for future inquiries (Schatz, 2020).

Furthermore, before surgery, patients frequently have different appointments. Additional queries are then addressed, and the patient is given another review of the scheduled procedure. An anesthetic nurse practitioner or a doctor may also see patients in a preoperative anesthesia clinic. Two types of information are exchanged in this situation: The anesthesia service conducts a preoperative anesthesia assessment, and the patient gets the chance to learn more about the anticipated anesthesia and postoperative pain difficulties. The perioperative nurses provide the final opportunity for preoperative teaching while they conduct their preoperative patient evaluation. They address any last-minute queries and worries during this time (Whyte & Grant, 2015). A patient's record according to numerous studies (Kiecolt-Glaser et al., 2018), prolonged convalescence and postsurgical fatigue are linked to "unpleasant and distressing symptoms associated with a major impact on the patient's quality of life" and are associated with a worse outcome in terms of length of hospital stay and complications. A

preoperative personal counseling session may be crucial in this situation to help patients cope with stress, anxiety, or panic and to improve their morbidity so they can achieve cardiovascular health, and compensating mechanisms in the respiratory, metabolic, and psychological systems more swiftly. The patient's ability to be a prospective active participant in his recovery is enabled by the clarification of the unknown and the thorough explanations of surgical and anesthetic processes, which improve postoperative recovery and discharge (Rubin et al., 2019).

According to numerous studies (Disbrow, 2013), surgical patients' physiologic recovery, morbidity, and wound healing response may be impacted by relaxation techniques or preoperative education programs in addition to verbal directions of procedures. The multidisciplinary team must weigh the advantages and disadvantages of each component, though, because not all patients want a thorough description of their treatment plan (Broadbent et al., 2020). The goal of the thoracic nursing specialization is to help patients with thoracic disorders have the best results possible in terms of their physical, psychological, social, and spiritual well-being. In addition to emphasizing the in-hospital therapies that the patient got, the care given also covers the entirety of the patient's journey, including lifestyle adjustment, health concept promotion, and self-empowerment (Yeung, 2016). Giving patients access to high-quality preoperative information makes it easier for them to participate actively in their care, which may raise satisfaction levels overall. Preadmission information intervention significantly improves knowledge of self-care and complication management while lowering postoperative pain levels (White & Dixon, 2015).

Significance of the study

Thoracic surgery is currently experiencing a notable resurgence in the United Kingdom, despite the specialty's contested age (Pons & Lim, 2022). The prominence of global lung cancer screening programs, which have been shown to lower overall lung cancer mortality, has resulted in a large increase in workload (Field et al., 2021). Additionally, studies into rib fixation (Ollivere & Beale, 2019), lung diseases associated with vaping (Shah et al., 2021), Potential volumes of surgical work are being

brought on by the growth in metastases, resection, and the unknown entity lung injury. A larger and more highly skilled thoracic workforce than ever before will be needed to handle this increase in labor. Compared to all other surgical specialties, cardio-thoracic surgery patients have a greater mortality rate (National Institute for Cardiovascular Outcomes, 2022). Thoracic surgery has a 20% morbidity rate and a 2% overall death rate. Additionally, it has been noted that postoperative complications are more likely than intra-operative ones to result in death in all non-cardiac surgical patients. Further education in postoperative treatment could reduce patient morbidity and death in light of this (Spence et al., 2019). According to the researcher's clinical observations, video-assisted thoracic surgery (VATS) is a novel method employed in the cardiothoracic surgery division in place of thoracotomies to treat a variety of disorders. Consequently, this study was conducted to assess how patient knowledge, practice, and stress related to thoracoscopic surgery were affected by instructional guidelines.

Aim of the study: This study aimed to evaluate the effect of instructional guidelines on patients' knowledge, practice, and stress regarding thoracoscopic surgery through:

Determine the pre- and post-thoracoscopic surgery patients' knowledge, practice, and stress level of both groups.

Developing, and implementing instructional guidelines for patients undergoing thoracoscopic surgery in the light of utilizing the studied patients' needs.

Evaluating the effect of the instructional guidelines on patients' knowledge, practice, and stress level regarding thoracoscopic surgery of both groups.

Research hypotheses:

H1: The total knowledge and practice scores of the experimental group patients will be improved more than the control group.

H2: Patients in the experimental group will have less stress following thoracoscopic surgery than patients in the control group.

Subjects & Methods:

Research design: This study was carried out using quasi-experimental research design.

Setting: This study was carried out in the thoracic surgery department at Damanhour university hospital.

Subjects: The study subjects included a purposive sampling technique enrolled to select a sample of fifty patients undergoing thoracoscopic surgery in the previously selected department who agreed to participate in the study and were randomly assigned into two equal groups, with 25 patients in each group (the experimental group who received instructional guidelines and the control group who received routine hospital care only). The sample was 73 patients selected by using the following equation (Steven, 2012).

$$n = \frac{N \times p(1-p)}{\left[\left[N-1 \times (d^2 \div z^2) \right] + p(1-p) \right]}$$

N=total patient population size of 70 who visited the cardiothoracic department at Damanhour university hospitals for VATs in the years 2022–2023, by Z=confidence levels is 0.95 and is equal to 1.96, D=the error ratio is =0.05, P=the property availability ratio, and neutral =0.50. Only 50 patients stay with the researcher until the end of the follow-up, and 10 do not return calls.

Tools for data collection: To fulfill the goal of the current study, relevant data were gathered using the following four tools.

Tool (1) Patients interview questionnaire.

To evaluate the demographic information and medical history of the study's participants, the researcher created and improved this tool. Based on a literature review, the researcher created it. The following elements formed its foundation: Part (a): It included demographic data of the patients as age, sex, level of education, and occupation). Part (2): This part included medical history (present history).

Scoring system: Regarding the knowledge of thoracoscopic surgery among patients: This contains 13 inquiries: Each item receives a score between 0 and 2, with the following possible outcomes: unknown, incomplete, and correct. Total scores fall between 0 and 26, according to the range. Patients' knowledge was categorized as follows: $\geq 50\%$ of knowledge must be satisfactory, and $< 50\%$ must be unsatisfactory.

Tool (3) Patients' practice assessment sheet (pre/post the implementation of the instructional guidelines):

Based on a literature analysis, the researcher created and adjusted this measure to evaluate patients' practices. It included a pre- and post-observation checklist for the patients (using a spirometer, breathing, and coughing exercises, foot- and legwork, and hand- and shoulder-strengthening exercises). **Scoring system:** Regarding the patient's experience with thoracoscopic surgery: This consists of the following 4 primary exercises: Each step receives a score between 0 and 2 points, with the options being "not done," "done incorrectly," and "done correctly." The patients' treatment was categorized as the practice that is adequate is $\geq 50\%$ and practice that is not adequate is $< 50\%$.

Tool (4) Cohen's Perceived Stress Scale Short Version (PSS-10):

It was created by the updated version of Cohen (2012). To gauge the stress level of the subjects, it was modified. There were ten questions in it, and they asked about feelings and thoughts from the previous month. (Cohen, 2012) On a three-point Likert scale, each response was coded as frequently (3 points), occasionally (2 points), and Never (1 point). Each subject had a total score that varied from 10 to 30. The perceived stress levels of the subjects were divided into three categories: low stress (17), average stress (17–24), and high stress (24).

Administrative design: The chairman of the thoracic surgery department at Damanhour University Hospital received a letter from the nursing faculty at Damanhour University outlining the goals of the study and requesting their consent to gather the data.

The study Protocol: This study was carried out in three phases:

Phase I: Preparatory phase: Books, essays, periodicals, and magazines were used to review previous and present, local, and international, related literature in many aspects. The number of patients admitted to the department of thoracic surgery who had thoracoscopic surgery was used to evaluate the suggested study settings.

Tools validity and reliability: The tools were reviewed for clarity, relevance, comprehensiveness, understanding, applicability, and ease of use by five experts: two medical staff members from the cardiothoracic surgery department, two nursing staff members from the medical-surgical nursing, and one expert in psychiatric nursing. If any administrative modifications were found to be necessary, they were made, and the tools were corrected as necessary. Cronbach's alpha coefficient ($\alpha=0.829$), which is regarded as being in a satisfactory range, and Cohen's Perceived Stress Measure Short Version reliability ($r = 0.894$) were used to confirm the consistency of the tools.

A pilot study: To assess the viability and clarity of the tools, pilot research was carried out on five patients who were admitted to the thoracic surgery department and made up 10% of the sample. The results of this pilot study show that no changes were made. The patients who took part in the pilot study were included in the study to determine the tool's applicability, identify any issues that would hinder the data collection process, and determine how long it would take patients to complete the study tools.

Ethical and legal considerations: The nursing faculty's ethics committee granted its approval. Hospital management gave their official consent for the study to be carried out. Pre-granting an informed consent to participate, each patient was informed of the study's goal. The coding of all data ensured the privacy and anonymity of the patients. Each participant is free to leave the study at any time and without giving a reason.

Phase II: implementation phase: From June 2021 to September 2021, information was gathered at the Damanhour University Hospital's thoracic surgery division. Before gathering data, all patients were informed of the study's goal and the instruments were filled out through interviews. All available patients participated in the trial throughout the morning and afternoon shifts. Patients who had been admitted to the unit and who met the criteria were obtained each day from the hospital's thoracic surgery department once permission was granted to move forward with the proposed study. The research proposal was then submitted to the research committee at Damanhour university hospital.

The researcher fills out the patient's assessment tools for the control group after getting the patient's oral consent for voluntary participation in the study. The patient is called for a follow-up appointment one month after thoracoscopic surgery to visit an outpatient clinic so that the patient's knowledge, practice, and stress related to thoracoscopic surgery can be reevaluated by the researchers after one month of using the instructional instructions. After the study group fills out the patient assessment forms, the researchers evaluate the knowledge, experience, and stress of the patients regarding thoracoscopic surgery. They then explain to the patients the instructional guidelines that the researchers developed after conducting a thorough and pertinent literature review based on the study group's needs assessment.

Through sessions, the guidelines were put into practice. The study's subjects were split into 10 groups, each of which had 5 patients. Each group's instructional guidelines took two hours, and they were allocated as follows: (2) sessions

for the theoretical portion, with each session lasting between 30 and 45 minutes, and (2) sessions for the practical portion, with each session lasting between 35 and 45 minutes. For discussion and comments, each session is allotted 10 minutes. An overview of the lessons from the previous session and the goals of the new topics are often covered at the beginning of each session. Each group of patients received these sessions again. Everything about thoracoscopic surgery is covered in the instructional guidelines, which were written in a straightforward Arabic language with straightforward photo illustrations. This includes an overview of the anatomy and functions of the thorax, the surgical procedure, multimodal analgesia, nursing care, pre-post care, and follow-up instructions regarding thoracoscopic surgery. The patient received it throughout four sessions, each of which lasted roughly 40 minutes and included 15 minutes for questions and answers. A copy of the instructional nursing booklet was provided to each participant in the study group.

Evaluation phase: one month following the use of instructional guidelines and their effect on patients' knowledge, practice, and stress regarding thoracoscopic surgery as a post-test was conducted using the same tools used before.

Statistical design: Data analysis was done using SPSS version 23 of the Statistics Package for (SPSS). The demographic information and quantitative data from every questionnaire were analyzed using descriptive statistics. Frequencies and percentages were included in descriptive statistics. Use a cross-tabulation test (Pearson chi-square) to compare patient knowledge before and after the program. Independent t-test and Pearson Correlation, which is significant at the 0.05 level, were both employed in the nova. To find any evidence of differences in the available data, the level of significance for this investigation was chosen at ($p < 0.05$).

Results

Table (1): shows that more than two-fifths of the control group (48%) and three-fifths (60%) of the study group were under-30-years-old. 80% of the patients in the study group and 60% of the control group were men, respectively. In terms of education, 40% of the participants in the study and the control group had a university education. More than half of the study group (52%) had no employment, in the same way (60%) in the control group.

Table (2): demonstrates that only 30% and 34%, respectively, of the study and control group had a diagnosis of a lung, mediastinal, or pleural mass.

As can be seen in **Table (3)**, the majority of the study participants' knowledge of thoracoscopic surgery increased following the implementation of the instructional guidelines in the study group compared to control group, and there was a highly statistically significant difference between the participants' knowledge in the control and study groups before and following the implementation of the guidelines ($P < 0.001$).

Figure (1): shows that, before the adoption of instructional guidelines, most of the patients' knowledge about thoracoscopic surgery was at unsatisfactory level in control and study groups (90% and 84%) respectively. Nevertheless, (80%) of them possessed a satisfactory level of knowledge following the application of the instructional instructions. Additionally, it is clear that, following the execution of instructional instructions, there was a highly statistically significant difference in the overall knowledge between research groups patients' pretest and posttest results.

Table (4): shows that among the control and study groups' patients, there was a highly significant variation in overall practice before and after the adoption of instructional instructions.

Table (5): demonstrates the highly significant association between the study

group's knowledge and practice.

With a highly statistically significant difference between pre- and post-instructional guidelines implementation, **Table (6)**: demonstrates that before the implementation of the instructional guidelines, 60% of the study group experienced a high level of stress, which fell to 8% after the implementation ($P < 0.012^*$).

Table (7): Showed regression analysis between knowledge, practice, and stress level among the study group. As revealed from the table, there was good regression between knowledge, practice, and stress level among the study group and reported that there was a high statistical significance difference between knowledge, practice, and stress levels among the study group P-value ($P < 0.000$).

Table (1): Frequency distribution of the studied patients in both study and control groups concerning their demographic characteristics (n=50).

Variables	Study (n=25)		Control (n=25)	
	No.	%	No.	%
Age				
▪ < 30 years	15	60.0	12	48.0
▪ 30- < 41 years	10	40.0	13	52.0
Sex				
▪ Male	20	80.0	15	60.0
▪ Female	5	20.0	10	40.0
Level of education				
▪ Illiterate	6	24.0	4	16.0
▪ Primary education	5	20.0	5	20.0
▪ Secondary education	4	16.0	6	24.0
▪ University education	10	40.0	10	40.0
Occupation				
▪ Non-working	13	52.0	15	60.0
▪ Working	12	48.0	10	40.0

Table (2): Frequency distribution of the studied patients in both study and control groups concerning their present health history (n=50).

Variables	Study group (n=25)		Control group (n=25)	
	No.	%	No.	%
▪ Lung, mediastinal or pleural mass	7	30.0	9	34.0
▪ Pleural effusion	4	16.0	3	12.0
▪ Hyperhidrosis	4	16.0	3	12.0
▪ Recurrent spontaneous pneumothorax	2	8.0	3	12.0
▪ Emphysema	2	8.0	2	8.0
▪ Empyema	1	4.0	1	6.0
▪ Bullous lung disease	1	4.0	2	8.0
▪ Others	4	16.0	2	8.0

Table (3): Frequency distribution of the studied patients' knowledge in both study and control groups about thoracoscopic surgery pre- and post-instructional guidelines implementation (n=50).

Patients' knowledge	Pre- instructional guidelines implementation		Post-instructional guidelines implementation		P-value
	Study group (n=25)	Control group (n=25)	Study group (n=25)	Control group (n=25)	
▪ Overview of anatomy and functions of the thorax	5(20)	6 (24)	21(84)	6 (24)	<0.001*
▪ Definition of thoracoscopic surgery	5(20)	10(40)	20(80)	10(40)	<0.001*
▪ Indications of thoracoscopic surgery	10(40)	12 (48)	15(60)	12 (48)	<0.001*
▪ Risk factors of thoracoscopic surgery	3(12)	5 (20)	18(72)	5 (20)	<0.001*
▪ Contraindications of thoracoscopic surgery	9(36)	10(40)	21 (84)	10(40)	<0.001*
▪ Advantages of thoracoscopic surgery	6 (24)	3(12)	21(84)	3(12)	<0.001*
▪ Complications of thoracoscopic surgery	12 (48)	10(40)	24(96)	10(40)	<0.001*
▪ Preparations of thoracoscopic surgery	5 (20)	5 (20)	21(84)	5 (20)	<0.001*
▪ Nursing care and instructions after discharge	10(40)	9(36)	20(80)	9(36)	<0.001*

Chi-Square Tests

**= highly significance, $p \leq 0.01$

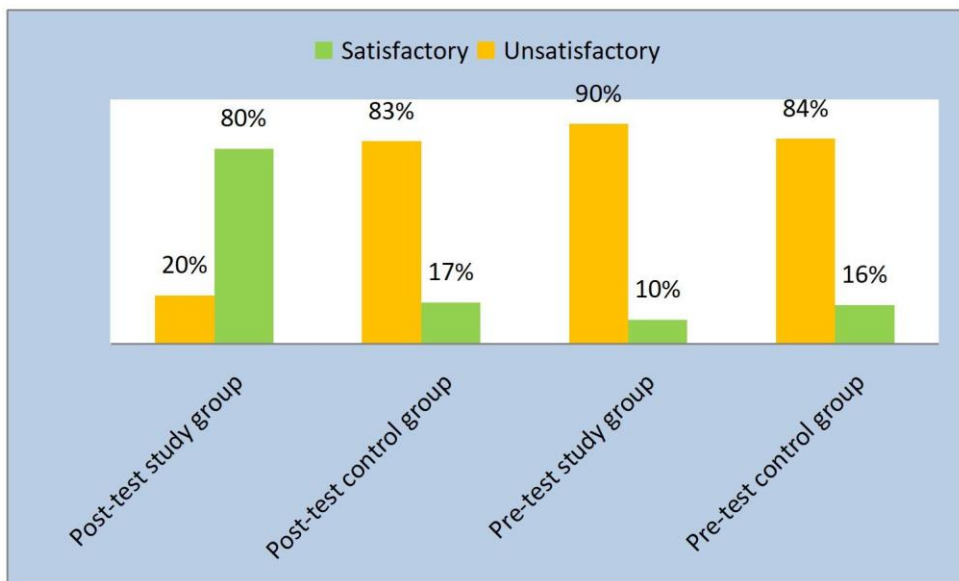


Figure (1): Frequency distribution of total patient knowledge about thoracoscopic surgery among study and control groups pre- and post-instructional guidelines implementation (n=25).

Table (4): Distribution of the studied patients in both study and control groups concerning the total practice of thoracoscopic surgery pre- and post-instructional guidelines implementation (n=50).

Variables	Pre- instructional guidelines implementation		Post-instructional guidelines implementation		P. value
	Study group	Control group	Study group (n=25)	Control group (n=25)	
Total breathing and coughing exercises	0.31±1.37	0.34±1.92	9.22±2.44	.35±1.88	0.001**
Total an incentive spirometer	0.85±3.43	0.89±3.62	6.122±6.77	.86±3.55	0.004*
Total foot and leg exercises	0.42±3.14	0.47±3.33	13.44±2.33	.45±3.44	0.001**
Total hand and shoulders exercises	0.52±3.22	0.55±3.57	17.11±7.34	.54±3.77	0.001**
Total practice	2.44±9.76	2.53±9.98	45.87±13.36	2.22±9.88	0.001**

*=Significant difference, * $p \leq 0.05$

**= highly significance, $p \leq 0.01$

Table (5): Correlation between knowledge and practice (n=50).

Variables	Practice	
Total patient knowledge	Pearson Correlation	0.565**
	Sig. (2-tailed)	0.002

** Correlation is significant at the 0.01 level (2-tailed).

Table (6): Distribution of both study and control groups concerning their stress level pre- and post-instructional guidelines implementation.

Stress	Pre- instructional guidelines implementation				Post-instructional guidelines implementation			
	Study group		Control group		Study group		Control group	
	No.	%	No.	%	No.	%	No.	%
▪ Normal	0	0.0	0	0.0	3	12.0	0	0.0
▪ Average	10	40.0	9	36	20	80.0	15	60
▪ High	15	60.0	16	64	2	8.0	10	40
P value between group	X= 7.442 P= 0.012*							

X²= Chi-Square test

* Significant p at ≤ 0.05

Table (7): Regression analysis between knowledge, practice, and stress levels (n=25).

Variables	Knowledge	
	R	P- Value
▪ Practice level	0.683	0.000**
▪ Stress level	0.734	0.000**

R-squared

* Significant p at ≤ 0.05

Discussion:

The role of thoracoscopic surgery has expanded in recent years, and most thoracic surgeons now view it as the best therapeutic option for patients with pulmonary nodules (Yim et al., 2020). Numerous studies have conclusively shown that thoracoscopic surgery is superior to thoracotomy in many situations. The advantages of thoracoscopic surgery over thoracotomy include less postoperative pain, improved arm and shoulder mobilization, a shorter hospital stay, and lower morbidity rates (Walker, 2019). According to the findings of the current study, more than two-fifths of the control patients and three-fifths of the study group's patients were under the age of thirty. The mean patient age in this study was 27.8 years, with a range of 19 to 35 years, which was consistent with the findings of Hammad & Saad (2012). According to this study by Schwarzbach et al. (2010), the median age of patients was 66 years in the study group and 60 years in the control group, which is in contrast to the current study's findings on patient age.

According to the findings of the current investigation, men made up three-fifths of the control group and the majority of the patients in the study group. Schwarzbach et al., (2010) reported the same outcome in both groups, and this investigation matched their findings. In addition, El Khayat, (2014), who researched thoracoscopic surgery at Assiut University, observed that most of the patients were men. Regarding diagnosis, it was shown that in both groups, the majority of patients had lung, mediastinal, or pleural mass. These findings are consistent with El Khayat's (2014) observation that undetected pleural effusions were the most often operated-on disease, followed by mediastinal masses, clotted hemothorax following trauma, pneumothorax, empyema, hyperhidrosis, and finally bullous lung disease. Similar findings were reported by Schwarzbach et al. (2010), who noted that the

majority of patients in both groups received VATS for pulmonary wedge resection that was either diagnostic or therapeutic.

The results of the current study showed that, overall, the knowledge of thoracoscopic surgery among the study participants increased after the implementation of the instructional guidelines compared to before, and that there was a highly statistically significant difference between the knowledge of the participants before and after the implementation of the guidelines. This supports the good impact of using the instructional guidelines, according to the researchers. The findings of Brunetti et al. (2013), who stated that preoperative educational programs serve to set expectations regarding surgical and anesthetic procedures, may lessen fear, weariness, and discomfort, and may improve recovery and early discharge, backed up this finding. After surgery, cognitive therapies, verbal education, and information comprising procedure explanations may help patients better manage their pain and anxiety.

The results of this study concur with those of Sebio Garcia et al. (2016) who reported that education has positive effects with no evidence of negative effects, suggested that patients regularly receive dedicated preoperative education, and came to the conclusion that education is positive and achieves maximum efficacy. The current study discovered that, before the introduction of instructional guidelines, the vast majority of patient knowledge about thoracoscopic surgery was at an unsatisfactory level. From the researchers' perspective, it demonstrated the urgent necessity to create instructional guidelines for such patients to address their knowledge gap. According to the findings of the current investigation, there was a highly significant change in the overall

practice of study group patients between the application of instructional guidelines before and after the study. This demonstrates, in the researchers' opinion, that the introduction of instructional guidelines satisfies the demands of patients and enhances practice. The results of this study are consistent with those of **Pehlivan et al. (2019)**, who demonstrated that preoperative prophylactic physical therapy is a critical and effective strategy for preventing or reducing postoperative stress, in addition to enhancing treatment by acquainting the patient with the physiotherapeutic techniques.

Similar to what **Batchelor et al. (2018)** stated, a preoperative exercise rehabilitation program can shorten hospital stays and postoperative problems. Additionally, physical activity is a technique of disease control and treatment for patients, according to **Boujibar et al.'s (2018)** paper. Particularly beneficial to both physical and mental health, exercise is essential for people who feel their quality of life has declined as a result of medical, psychological, emotional, and financial problems. According to this study, there was a highly statistically significant difference between the pre-and post-implementation of instructional guidelines, and 35% of the study group reported high levels of stress, which reduced to 10% or less after the implementation. Since both groups had a comparable percentage of patients who had received an education, it is unlikely that stress factor levels would change after this period (**Catley et al., 2018**). Similar findings were made by **Tschernko et al. (2016)**. This result supports **Walker & Leaver's (2017)** conclusion that minimally invasive thoracic surgery greatly reduces the acute-phase response and surgical stress while facilitating improved postoperative care.

This study discovered a significantly substantial association between the study group's knowledge and practice. According to the researchers, it showed that when patients had acceptable information, it was connected with adequate practice. The results of the

present study are corroborated by **Deasy et al. (2014)**, who found that perioperative rehabilitation measures such as deep breathing exercises, incentive spirometry, and ambulation are advised to prevent postoperative problems. Additionally, **Valenzuela et al. (2017)** in agreement with the present study noted that the preoperative physiotherapy education group had shorter hospital stays and less postoperative problems. According to **Sebio Garcia et al. (2016)**, postoperative problems can be prevented and treated more effectively with preoperative education and adequate postoperative care.

The current study discovered a strong correlation between knowledge, practice, and stress levels within the study group as well as a highly significant statistical difference between knowledge, practice, and stress levels among the study group. According to the researchers, this demonstrates that the use of instructional guidelines satisfies student demands and enhances learning and practice, which has a positive impact on stress levels. **Refai et al., (2018)** found that preoperative personal education may be crucial in lowering stress and anxiety in patients and improving their morbidity, allowing patients to swiftly develop functional and psychological compensating mechanisms. The current study came to the conclusion that the findings supported the study's hypothesis, which was that implementing instructional guidelines could help patients' knowledge, practices, and stress levels. This conclusion is consistent with those reached by previous studies by **Tsitsias et al., (2019)**, **Ljungqvist & Scott (2017, 2018)**, **Schatz (2015, 2015)**, and **Whyte RI, Grant (2018)**.

Conclusions:

Following the application of instructional guidelines, the current study's findings indicated gains in overall knowledge, practice, and stress level. After the

application of the instructional guidelines, there were larger percentages in the study group than in the control group of improvements in overall knowledge, practice, and stress reduction.

Recommendations:

Based on the findings of the present study, the following recommendations are suggested:

- 1) Instructional guidelines should be given for patients to improve their knowledge, practice, and reduce stress regarding thoracoscopic surgery.
- 2) To give thoracoscopic patients the necessary knowledge, a written educational handbook prepared in simplified terms and with basic illustrations should be made available for each patient.
- 3) To acquire more generalizable results, it is advised that the study be replicated on a larger probability sample chosen from various geographic areas in Egypt.

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